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ISLT 9458: Technology and Assessment

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Performance Assessment

1. Context:

I am currently a 7th grade special education teacher. In my building the special education teachers specialize in subject matters so therefore I teach Math and Science. Currently we are finishing up our unit on Animals and are beginning a unit on Ecology in Science class. For this reason, I have decided to create my performance assessment based on 7th grade GLE's for Missouri and focus on Science and Ecology. In this portion of Ecology the students will be asked to

Grade Level – 7th
Subject – Science

Ecosystems: 4:1:A: All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem.

Ecosystems: 4:1:C: All organisms including humans and their activities cause changes in their environment that affect the ecosystem.

2. Essential Question:

How do human decisions affect the ecosystem throughout the world?

How do human decisions affect the animals and plants that humans require to survive?

3. GRASPS:

Goal:

- Your task is to find how different plants and animals respond to their environment when changes occur.
- The goal is to explore food chains and green house effects to examine how humans effect the ecosystem.
- The challenge is to develop an action plan so that we can reduce human effects on the environment

Role:

- You are now in control of an ecosystem; controlling a food chain and the environment in order for the greatest number of survivors.
- You have just been asked to control the environment to reduce the number of species that become endangered or become extinct.
- Your job is to adapt the environment and human impact in order to reduce changes in the ecosystem.

Audience:

- Your clients are the organisms throughout the Earth.
- Your target audience is those who create changes to our environment who affect the Earth's ecosystem.
- You need to convince everyone on the planet how the choices they make can affect the ecosystem and their own lives.

Situation:

- The context you find yourself in is the changes in the ecosystem and how they are affecting the world around us.
- The challenge involves dealing with how we can change the choices we make in order to reduce the changes to the ecosystem.

Product, Performance, and Purpose:

- You will explore food chains and the greenhouse effect in order to observe how humans can impact and change an ecosystem.
- You will research different "green" items: cars, solar power... in order to see how humans are already making changes to help the ecosystem.
- You will create a wiki page that will help promote one of the already created "green" items in order to demonstrate your understanding of how humans can change their choices now to change the ecosystem in the future.
- You and your group will develop your own "green" item that will help change the world in the future.

Standards and Criteria for Success:

2. Your performance needs to show that you have gained an understanding of how humans effect the ecosystem
3. Your work will be judged by the production of your wiki page as well as your groups green item
4. Your product must meet the following standards:
 1. You must show that you recognize how a food chain works and how changes in an ecosystem can affect the food chain
 2. You must be able to show how greenhouse gasses effect the Earth
 3. You must show how human choices have affected the Earth's ecosystem and recognize how your changes can change the ecosystems in the future.

5. Vignette:

Clean burning coal, solar power, wind power, oil spills (Science: Ecosystems; grades 6-8) ... so often now a days we hear about how we as humans are effecting the Earth and how we need to change in order to help the earth survive. Although this is a topic that is very common to hear in recent years, have you ever considered how humans truly do effect the earth? Have you considered which "green" products are truly helpful, and which are just a hoax that has jumped on the new trend? What can we do as humans that will truly make an impact on the future of the earth?

Your task lies in three parts. Part one is to research food chains and the greenhouse effect. Using Explore learning™ and their Gizmo's you will play with "Earth" and see how changes in the environment has an effect on the organisms that live there. You will then look at a greenhouse and observe how changing the greenhouse gasses changes the temperature over a period of time. After observing these effects, you will then research, independently different "green" products or items out in the market today. You will create a wiki page that helps promote an item that you have decided can make an impact on the environment. You

will prove this by explaining how using this item effects the ecosystem for the better. Your final task is to create your own “green” product as a group. You will then present this product using Prezentit™

6. Performance Assessment Plan

A. Day 1 (1 80 minute block) – Students will be in the computer lab. Students will explore two of Explore Learning™’s “Gizmo’s”.

A. Greenhouse Effect:

<http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&ResourceID=372>

1. Vocabulary: Global Warming, Greenhouse effect, greenhouse gas, heat flow
2. Have students answer questions from the lesson sheet that is included on the Explore Learning™ website. **Some questions have been changed or eliminated.
3. The students should be able to gain some understanding of how heat flow effects the greenhouse gasses.

B. Food Chain:

<http://www.explorelarning.com/index.cfm?method=cResource.dspDetail&ResourceID=381>

1. Vocabulary: consumer, ecosystem, equilibrium, food chain, population, predator, prey, producer
2. Have the students explore the Food Chain Gizmo™ and answer the questions about food chains provided by the Explore Learning™ website **Some of the questions have been changed or eliminated
3. The students should gain a greater understanding of how producers and consumers effect one another and rely on a balance in order to have a balanced ecosystem.

B. Day 2 & 3 (2: 80 minute blocks)

- A. After exploring how environmental changes can affect the ecosystem, the students are now being asked to find a “green” item that they believe will promote greater life on earth, a more balanced ecosystem. The students are to explore different “green” items and select one that they believe reduces greenhouse gasses, reduce over consumption of an item, reduces pollution, or a variety of other ideas. The students are then to create a wiki space page that acts as an advertisement for the item. They need to include why this item is good for the ecosystem and how it will affect the Earth now and in the future. The advertisement should demonstrate the student’s understanding of how positive changes from humans can effect an ecosystem and also how that item works. The advertisement should include pictures and means in which to purchase the item.

C. Day 4 & 5 (2: 80 minute blocks)

- A. The students will then work in groups developing their own “green” item. They will create their own item, not already invented, or improve on an item they feel could benefit the ecosystem but needs changes. They then need to create a presentation using Prezent it™ <http://prezentit.com/>, to collaboratively create a presentation that they will present to the class.

D. Day 6 (1: 80 minute block)

- A. The groups will share their new inventions with the class. They will explain how their “green” item will affect the ecosystem for the better and how this will positively affect the organisms that surround it. Each group will present their information to the class.

7. Evaluation:

Individual Evaluation:

1. The first way in which the students will be assessed will be through their completion of the two question packets as part of day one exploration. I am look for insightful learning and a basic understanding of the greenhouse effect and food chains.

2. Wiki Pages- Advertisement

Descriptions:	3	2	1	0
Green Item	Selected an appropriate “green” item that makes a positive impact on the ecosystem	Selected a “green” item.		Made no selection of a “green” item.
Advertisement Appearance	Advertisement is flashy, eye catching an appealing: Contains pictures and descriptions	Advertisement contains some items but lacks good descriptions or images	Advertisement lacks color or pictures. May have little to no descriptions	No advertisement made
Connection to Ecosystem	Connections made between how the green item affects the environment positively	Connects are made but not described in great detail	Vague connection	No connection made or the item does not have a positive impact on an ecosystem

Group Evaluation:

1. Prezent it™ Presentations

Invention/ Improvement	2	1	0
Description	Detailed description of the invention or improvement. Describes how the item works and what it will affect	Description of how the item works but lacks great detail	No description of the item is provided.
Images	Images were drawn and then scanned or created using a computer that will help individuals visualize what the item looks like.	Some images were provided but lack details making the item difficult to visualize	No images were provided
Ecosystem	Description and detail of the ecosystem this “green” item affects. Describing the organisms that live in the ecosystem and how they are currently affected by humans and the choices they have made	Description of the ecosystem is provided but lacks details about the organisms and human effects on the ecosystem	No description of an ecosystem was provided
Changes	Describes in great detail how the invention or change in product will change the negative effects that are currently taking place in the ecosystem. Makes connections to the organisms and how the food chain might change due to this item’s impact.	Descriptions of the inventions connections to changing an ecosystem are made but are vague or lack details. Lacks support.	No description of how the item may change an ecosystem made.
Presentation	2	1	0
Contains emphasized items above	Appropriate description of item, the ecosystem, and how the item will make changes to the environment.	Descriptions are vague or lack detail. The students may explain about the “green” item but may lack connections to the environment or how the changes will affect the ecosystem.	No description of item or the ecosystem or its impact on the ecosystem.
Visual Appeal	Presentation is eye catching, and easy to follow. There are visual pictures that help gain greater understanding.	Presentation lacks color or appeal. The presentation lacks pictures or has minor errors.	No presentation or major errors. No pictures or images

Name: _____

Date: _____

Student Exploration: Greenhouse Effect

Vocabulary: global warming, greenhouse effect, greenhouse gas, heat flow

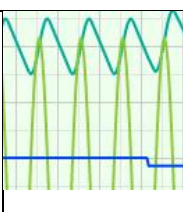
Prior Knowledge Questions (Do these BEFORE using the Gizmo.)

1. What do you notice when you get into a car that has been sitting in the Sun for a while?

On the *Greenhouse Effect* Gizmo™, set the **Greenhouse gases** to 0% and the **Simulation speed** to **fast**.

1. Click **Play** (▶) and view the BAR CHART tab. The temperature will go up and down every day, but try to look at the overall trend. What happens to the temperature over time?

2. Now set the **Greenhouse gases** to 100% and let the simulation run for a while. How does a maximum amount of greenhouse gas affect the temperature?

<p>Activity:</p> <p>Heat in, heat out</p>	<p><u>Get the Gizmo ready:</u></p> <ul style="list-style-type: none">• Click Reset (↺).• Set Simulation speed to slow.• Be sure the Greenhouse gases level is 10%.	
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Question: How do greenhouse gases affect Earth's climate?

1. **Observe:** Select the BAR CHART tab and click **Play**. After about 24 simulated hours, click **Pause** (⏸). What do you notice about the **heat flow** into and out of Earth's atmosphere?

2. **Analyze:** Select the TABLE tab.

- A. At what time of day is heat flow into the atmosphere (H_{in}) greatest? _____
B. At what time of day is heat flow into the atmosphere (H_{in}) least? _____
C. Does heat flow out of the atmosphere (H_{out}) change during a day? _____
D. At what time of day is surface temperature highest? _____ Lowest? _____

3. **Predict:** Click **Reset**. When you change the amounts of greenhouse gases in the atmosphere, which factor(s) do you expect to change? (Circle your answer/answers.)

Heat flow in

Heat flow out

Temperature

4. **Experiment:** Select the BAR CHART tab, and click **Play**. While the simulation is playing, move the **Greenhouse gases** slider back and forth. What do you notice?

5. **Experiment:** Click **Play**, and this time observe the GRAPH tab as you change the **Greenhouse gases**. What do you notice?

6. **Draw conclusions:** The influence of greenhouse gases on temperature is called the **greenhouse effect**. Based on what you have seen, how do greenhouse gases affect the heat flow into and out of Earth's atmosphere?

Name: _____ Date: _____

Student Exploration: Food Chain

Vocabulary: consumer, ecosystem, equilibrium, food chain, population, predator, prey, producer

Prior Knowledge Questions (Do these BEFORE using the Gizmo.)

1. Producer: _____
2. Consumer: _____
3. Predator: _____
4. Prey: _____)
- 5.

Gizmo Warm-up

The SIMULATION pane of the Gizmo shows the current **population**, or number, of each organism in the food chain.


1. What are the current populations of each organism?

Hawks: _____ Snakes: _____ Rabbits: _____ Grass: _____

2. Select the BAR CHART tab, and click **Play** (). What do you notice about each population as time goes by?

If populations don't change very much over time, the ecosystem is in **equilibrium**.

3. Compare the equilibrium populations of the four organisms. Why do you think populations decrease at higher levels of the food chain? _____

Activity A: Predator-prey relationships	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"> • Click Reset (⏮). • Check that the BAR CHART tab is selected. 	
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Question: **Predators** are animals that hunt other animals, called **prey**. How do predator and prey populations affect one another?

7. **Observe:** Run the Gizmo with several different starting conditions. You can use the **+** or **-** buttons to add or remove organisms, or you can choose **Diseased** from the dropdown lists.
8. **Form hypothesis:** How do you think predator and prey populations affect one another?

9. **Predict:** Based on your hypothesis, predict how changing the rabbit population will affect the other organisms at first. Write “Increase” or “Decrease” next to each “Prediction” in the table.

Change	Grass	Snakes	Hawks
Doubling rabbit population	Prediction: Result:	Prediction: Result:	Prediction: Result:
Halving rabbit population	Prediction: Result:	Prediction: Result:	Prediction: Result:

10. **Test:** Add rabbits until the population is about twice as large as it was (200% of balance). Click **Play**, and then **Pause** (⏸) after approximately ONE month. Next to each “Result” line in the table, write “Increase” or “Decrease.” Click **Reset** and then halve the rabbit population (50% of balance). Record the results for this experiment in the table as well.

A. How did doubling the rabbit population affect the grass, snakes, and hawks at first?

How did halving the rabbit population affect the grass, snakes, and hawks at first?

11. **Predict:** Predict how changing the snake and hawk populations will affect the other organisms within the first month. In the tables below, write your predictions.

Change	Grass	Rabbits	Hawks
Doubling snake population	Prediction: Result:	Prediction: Result:	Prediction: Result:
Halving snake population	Prediction: Result:	Prediction: Result:	Prediction: Result:

Change	Grass	Rabbits	Snakes
Doubling hawk population	Prediction: Result:	Prediction: Result:	Prediction: Result:
Halving hawk population	Prediction: Result:	Prediction: Result:	Prediction: Result:

12. **Test:** Click **Reset**. Try each experiment with the Gizmo. Record each result after one month.

A. How did increasing the snakes affect the grass? _____

Explain why: _____

B. How did increasing the hawks affect the rabbits? _____

Explain why: _____

13. **Draw conclusions:** In general, what effect did removing prey have on predators? _____

What effect did removing predators have on prey? _____

7. Narratives:

A. Technology students will use and how it will enable your assessment of their performance:

There are several ways in which I have used technology in my performance assessment.

1. Students will use simulation tools in order to gain a greater understanding of how ecosystems work in regards to food chains as well as their connections to the greenhouse effect. The students are able to observe and manipulate ecosystems that they would not be able to do in real life. Through this exploration, the students are able to gain greater knowledge of food chains as well as greenhouse gasses. The students are not formally assessed using technology but they are assessed through the questions that are asked along with the online tool. The students are also performing the Scientific Method throughout this simulation in order to reinforce skills taught in previous units.
2. The students will use online databases to research “green” products and items. They will then use their new knowledge of ecosystems to make connections to why these items are helpful for an ecosystem. They will be assessed informally on their research skills because if they are required to have detailed information on the product as well as its’ effects on an ecosystem.
3. The students will also be exposed to Wiki pages. Through the use of a Wiki page, they will create an advertisement on their researched item. As stated earlier, they knowledge of that item or product and ecosystems will help determine their understanding of the unit. They will be assessed based off of their research and the content on their page. The advertisement must make connections to their what they learning during their exploration as well as their research about their item.
4. Prezent it™ presentations will be used when the students work in groups to create their own “green” products. They have the option to invent an item or improve on their own item. Again, the presentation tool will be used as an assessment, allowing the students to present to the class their knowledge of the subject matter. The students will have to make connections and establish roles during the presentation and through the creation of the item. Prezent it™ allows for greater collaboration and group presentations because it allows for students to be working a different computers but editing the same presentation. This allows for all students to have a part. Although some students may be more create and enjoy drawing their invention, some of the more mathematical minds might think of how the item will work. Other members of the group can determine how the item will affect the ecosystem therefore allowing for greater collaboration and diversity of learning styles.

Through all of the technology used in the performance assessment, the students are asked to not just have the technology, but to gain a greater understanding of how to use the technology to learn and collaborate. With the tools presented to them they are able to gain a greater knowledge of how an ecosystem is affected by humans and the decision we make.

B. Thought process behind the assessment:

The main reason behind my creation of this assessment is out of necessity. We are ending our school year quickly, and it seems that each year, we have less and less time for our Ecology unit. In addition, the unit falls after MAP testing and therefore the students, and some teachers have begun to check out and think about summer break. The students lack the interest in direct instruction and have a greater desire for group work and peer interaction. In addition, my co-teacher and I have struggled to create activities for our students that allow them to gain information necessary for success in the classroom but make it pertain to them beyond the classroom. Much of our instruction is life science, and making connections to why the students need to have the knowledge beyond their Biology classes in high school and possibly college is difficult. The subject of ecology however, pertains to our lives currently and in the future.

Considering all of this, I began looking over the Ecology unit and researching ways in which to make it fun and meaningful for my students. I also feel as though I need to give some background into my classroom. I teach 7th grade and we have a team structure in our building. My team is made up of all of the special education students, all of the ELL students and many of our basic and below basic MAP scoring students. Many of these students walked into our classroom discouraged and struggling. It became our team's goal to improve scores and find ways to teach our students the information and also catch them up on the items they still are lacking. This year was the first year for this team structure, and we have seen some great successes and failures. One way we have gained the greatest success is through simulated learning and technology. Computers and software have allowed our students to shorten the gap between their skills and their peers. Through a great deal of planning and research, we have worked hard to create an environment of exploration and learning.

With all of this in mind, I began to plan this unit. My co-teacher and I had to first determine our essentials. The district has been going through a great deal of changes this year, and part of that has required use to reassess what we consider essential and really get down to the "have to know's". Once we determined that, the chips began to fall. This is just one part of the unit, as we have a few other topics that our students are assessed on.

My first thought was the students need to gain a greater understanding of cause and effect, the food chains and greenhouse gasses. Although these are items that are readily discussed in the media and food chains have been taught forever, I felt that a simulation activity would best meet my student's needs. A traditional lecture or worksheet, reading packet would never appeal to our kids. As I stated before, the greenhouse effect is in the news constantly, and I was concerned that my students would disregard any reading or lecture because they believed they already had the knowledge. For this, an activity and simulation I found to be the best option. The activity allowed them to "play God" and change the ecosystem and find the affects. I felt that this would allow my students to experience their learning and truly gain a greater understanding of those concepts.

Once I knew that my students understood how humans effect the I need to take it further allowing them to make connections to what they have already seen or heard about. By doing research on already created "green" items, they were able to use their newly gained knowledge as well as draw from prior knowledge to assess how affective some of these green items are. They then had to create an advertisement for an item that they felt truly encompassed what a "green" item should be. They had to make connections to an ecosystem as well.

Lastly, I decided inventing an item took the skill to a "higher order thinking skill". This would be difficult for some of our students to do independently, and since our group enjoys group work as well as encourages speaking, a skill necessary for our ELL students, doing this as a group project seemed best. The assignment requires them to each work together on one task, but each can demonstrate their own strengths. There is a requirement for research, art work, computer skills and presentations. With all of that, my goal was that each student's learning styles could be hit and each student could contribute in their own way. Although some of my students speak little to no English, some are excellent drawers and can be the one to create the images of their item. With the use of Prezent it™ the students are able to collaborate, and create a presentation that all of them have a part of.

C. Self-Assessment of design

What I would like to accomplish from this activity is to see my students make connections about how their own actions and decisions can have a great impact on how our environment and ecosystem are affected. Being that this assignment is the last major assignment for them to move on to 8th grade, I am expecting my students to be more self-driven and demonstrate the skills we have worked on all year. I feel that this is a great form of assessment for our students because it is much more

performance and task based and so often, our students perform poorly on traditional assessments due to a variety of reasons. Through this performance assessment, my students should be able to demonstrate their understanding and knowledge of the content, without the traditional pencil and paper tasks.

Wiggins, I believe would be quite pleased with my performance assessment. I think that the assessment encompasses the six facts of understanding. One way I feel I have done this through the assessment is through the connections to “self”. Throughout this process, I have attempted to relate everything back to why it is important to learn and how you, as a human affects your ecosystem. By doing this, I believe that I have allowed my students to gain a deeper understanding of the content by making connections to their own lives and things they have seen and experienced.

Facet 1 of understanding is explanation. I have used the big idea of Ecology to teach my students about the affects they have on the ecosystem. They have to then connect it to their own lives and explain beyond simple knowledge how their lives and choices affect other organisms.

Facet 2 of Understanding is interpretation. I believe that I allowed for interpretation through the use of my vignette as well as through the simulation activity. The students are allowed to look at the data and interpret their own meaning.

Facet 3 of Understanding is application. I believe I accomplished this through my activity of creating their own green product. The students have to go beyond their understanding of ecosystems and human affects and actually create a solution. They have to go beyond their basic knowledge and prior knowledge and stretch to create something on their own.

Facet 4 of Understanding is perspective. I think that Wiggins would criticize me in this aspect. The “greenhouse effect” is certainly a controversial issue at this current time. Based on our GLE’s and what the other Science teachers believe, we have been instructed to only teach this item to state that we do have global warming. I think that Wiggins would expect me to teach both sides of the issue and allow for students to see differing points of view. Based on time constraints and GLE’s I have avoided this aspect and taught a more biased perspective. Although, I do not believe this to be the best method, it is a method. I hope that in my future lessons on Ecology, I can allow for multiple perspectives and allow for a debate like structure in my classroom.

Facet 5 of Understanding is empathy. I believe that this is one of my greatest strengths through this performance assessment. I believe that I have allowed my students to recognize that they have a great effect on this world and the ecosystems that surround us. Through this, I feel that I have allowed my students to develop greater empathy for other organisms and recognize how they may affect other’s and their own lives in the future.

Facet 6 of Understanding is self-knowledge. I believe that I have allowed for some self-assessment throughout this performance assessment. Although, through my exit-tickets I would ask more self-assessing questions, each aspect of the performance assessment requires students to look inward and reflect on their own decision making. It also requires from them to look at their own product and determine if they are willing to present that item for purchase. They need to feel confident that their product for their advertisement would sell based off what they produced. They also have to self-reflect and determine if their item they are inventing or adapting will have an effect on an ecosystem.

Through all of this, I feel I have gained a greater understanding of Understanding by Design. Having been my first attempt at this, I do feel that I have done a pretty good job. With my background knowledge in other formats and structures of lesson planning and assessment, I have had to change

some of my structure in order to fit the “Understanding By Design” format. Much of how I plan and assess fits this model and I do believe that Wiggins would be proud.